

EPIXHR1x4 test of emulated data

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Emulated data

Emulated data from Ric

```
Claus, Ric. 2023-04-25 11:51 AM
Dubrovin, Mikhail
O'Grady, Paul Christopher
Hi Mikhail,
The following two commands show where the ePixHR emulator data is:
detnames -i exp=tstx00417,run=276,dir=/cds/data/drpsrcf/tst/tstx00417/xtc
detnames -i exp=tstx00417,run=277,dir=/cds/data/drpsrcf/tst/tstx00417/xtc
You can view it with:
ami-local -b 1 -f interval=1 psana://exp=tstx00417,run=276,dir=/cds/data/drpsrcf/tst/tstx00417/xtc
but I think you already know that. You'll see 4 ASICs of data along the vertical axis (0 - 3) and each of the
segments along the horizontal axis.
Ric
```

- `exp=tstx00417,run=276,dir=/cds/data/drpsrcf/tst/tstx00417/xtc 20-panel epixhr_emu`
- `exp=tstx00417,run=277,dir=/cds/data/drpsrcf/tst/tstx00417/xtc 1-panel epixhr_emu`

Data fix for single-panel detector in run 277

To fix issues in data two methods re-implemented in `psana/detector/epixhremu.py`

`_config_object` - adds missing in data configuration info for

```
trbit = [0,0,0,0]
asicPixelConfig = np.zeros((144, 768), dtype=np.uint8)
```

Default geometry files

Detector package code is fixed to load default geometry from files if constants are missing in DB

`lcls2/psana/psana/pscalib/geometry/data/geometry-def-epixhr1x4-01.data`

`lcls2/psana/psana/pscalib/geometry/data/geometry-def-epixhr1x4-20.data`

lcls2/psana/psana/pscalib/geometry/data/geometry-def-epixhr1x4-20.data

#	HDR	PARENT	IND	OBJECT	IND	X0[um]	Y0[um]	Z0[um]	ROT-Z	ROT-Y	ROT-X	TILT-Z	TILT-Y	TILT-X
DETECTOR			0	EPIXHR1X4:V1	0	40000	15000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	1	40000	30000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	2	40000	45000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	3	40000	60000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	4	40000	75000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	5	40000	-15000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	6	40000	-30000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	7	40000	-45000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	8	40000	-60000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	9	40000	-75000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	10	-40000	15000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	11	-40000	30000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	12	-40000	45000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	13	-40000	60000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	14	-40000	75000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	15	-40000	-15000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	16	-40000	-30000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	17	-40000	-45000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	18	-40000	-60000	0	0	0	0	0.00000	0.00000	0.00000
DETECTOR			0	EPIXHR1X4:V1	19	-40000	-75000	0	0	0	0	0.00000	0.00000	0.00000
IP			0	DETECTOR	0	0	0	10000	90	0	0	0.00000	0.00000	0.00000

Commands to deploy constants

pedestals, pixel_rms, pixel_status, pixel_gain

```
epix10ka_deploy_constants -k exp=tstx00417,run=276,dir=/cds/data/drpsrcf/tst/tstx00417/xtc -d epixhr_emu -o ./work -D
```

```
epix10ka_deploy_constants -k exp=tstx00417,run=277,dir=/cds/data/drpsrcf/tst/tstx00417/xtc -d epixhr_emu -o ./work -D
```

geometry

```
cdb add -e tstx00417 -d epixhremu_000001 -c geometry -r 277 -f lcls2/psana/psana/pscalib/geometry/data/geometry-def-epixhr1x4-01.data -i txt -l DEBUG  
cdb add -e tstx00417 -d epixhremu_000002 -c geometry -r 276 -f lcls2/psana/psana/pscalib/geometry/data/geometry-def-epixhr1x4-20.data -i txt -l DEBUG
```

datinfo

```
datinfo -k exp=tstx00417,run=276,dir=/cds/data/drpsrcf/tst/tstx00417/xtc -d epixhr_emu
```

```
datinfo -k exp=tstx00417,run=277,dir=/cds/data/drpsrcf/tst/tstx00417/xtc -d epixhr_emu
```

det.raw.image

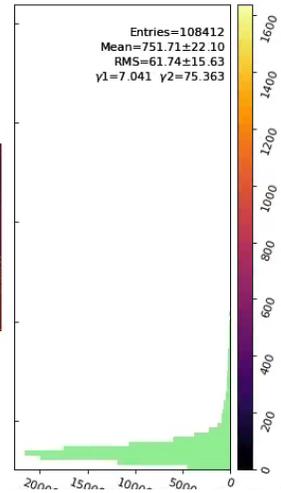
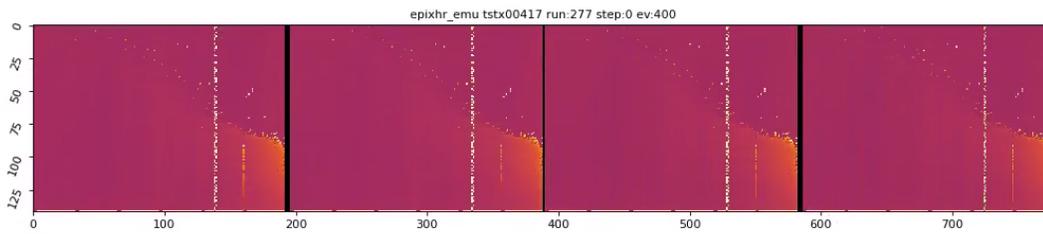
```
det.raw.image calls det.raw.calib
```

single-panel

```
epix10ka_raw_calib_image calib -k exp=tstx00417,run=276,dir=/cds/data/drpsrcf/tst/tstx00417/xtc -d epixhr_emu  
epix10ka_raw_calib_image -k exp=tstx00417,run=276,dir=/cds/data/drpsrcf/tst/tstx00417/xtc -d epixhr_emu
```

```
exp=tstx00417,run=277
```

```
single panel shape:(1, 144, 768)
```



New interface for single or a few of total number of panels

```
exp=tstx00417,run=277
```

```
segnums = det.raw._segment_numbers = [3,]
```

pedestals and other arrays from calib constants including mask and geometry coordinate and index arrays:

```
peds = det.raw._pedestals() # ped.shape=(7, 1, 144, 768)
```

```
peds = det.raw._pedestals(all_segs=True) # ped.shape=(7, 20, 144, 768)
```

```
mask = det.raw._mask(...) # mask.shape=(1, 144, 768)
```

```
mask = det.raw._mask(all_segs=True, ...) # mask.shape=(20, 144, 768)
```

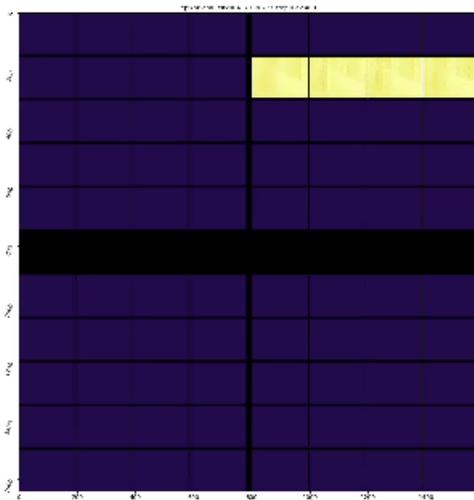
```
x,y,z = det.raw._pixel_coords(...) # x/y/z.shape=(1, 144, 768)
```

```
x,y,z = det.raw._pixel_coords(all_segs=True, ...) # x/y/z.shape=(20, 144, 768)
```

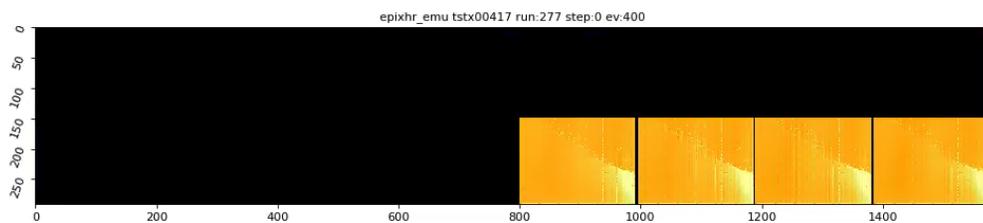
```
raw = det.raw.raw(evt) # raw.shape=(1, 144, 768) <== ALWAYS
```

```
raw = det.raw.calib(evt) # calib.shape=(1, 144, 768) <== ALWAYS, because derived from raw.
```

```
image = det.raw.image(evt, nda=None, value_for_missing_segments=100, **kwa)
```



```
image = det.raw.image(evt, nda=None, value_for_missing_segments=None, **kwa)
```

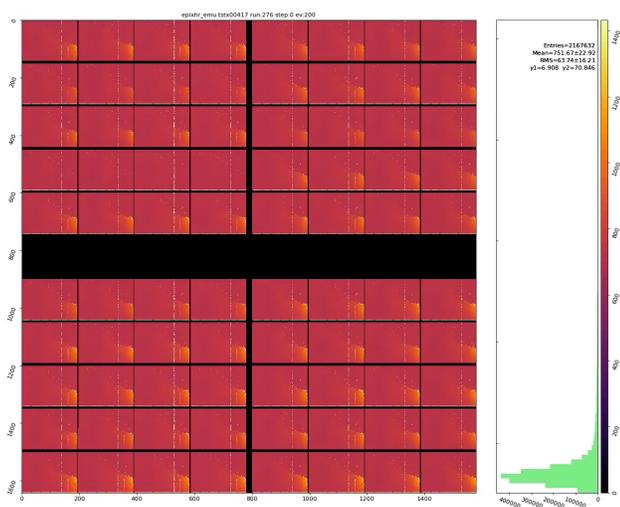


20-panel

```
epix10ka_raw_calib_image calib -k exp=tstx00417,run=276,dir=/cds/data/drpsrcf/tst/tstx00417/xtc -d epixhr_emu
epix10ka_raw_calib_image -k exp=tstx00417,run=276,dir=/cds/data/drpsrcf/tst/tstx00417/xtc -d epixhr_emu
```

exp=tstx00417,run=276

20-panel shape:(20, 144, 768)



Summary

- det.raw.raw/calib/image works for epixhremu as
- assuming that issue in data configuration are fixed, the real detector epixhr<real-name>.py needs to be implemented from epixhremu.py with removing fixes. in code

References

- [EPIX10KA2M References](#)